

CLAIMS

What is claimed is:

1. A communication device adapted for use in an automated monitoring system for providing remote monitoring of electricity consumption, the automated monitoring system comprising a site controller in communication with a plurality of electric meters via a wireless communication network and in communication with a host computer via a wide area network, the communication device comprising:

a data interface configured to receive data related to the electricity consumption of an electric meter;

memory comprising a unique identifier corresponding to the electric meter;

logic configured to receive the data related to the electricity consumption of the electric meter, retrieve the unique identifier corresponding to the electric meter, and generate a transmit message using a predefined communication protocol being implemented by the wireless communication network, the transmit message comprising the unique identifier and the data related to the electricity consumption of the electric meter and configured such that the transmit message may be received by the site controller via the wireless communication network and such that the site controller may identify the electric meter and notify the host computer of the transmit message; and

a wireless transceiver configured for communication over the wireless communication network and configured to provide the transmit signal to the wireless communication network and receive messages from the wireless communication network.

2. The device of claim 1, wherein the logic is stored in memory and the device further comprises a microcontroller configured to implement the logic.

3. The device of claim 1, wherein the wireless transmitter is configured to provide the transmit signal as a radio frequency signal.

1 4. The device of claim 1, wherein the wireless transmitter is configured to provide
2 the transmit signal as a low power radio frequency signal.

1 5. The device of claim 1, wherein the data interface is adapted for use with an
2 electromechanical electric meter which measures the electricity consumption associated
3 with the electric meter via a meter wheel and the received data related to the electricity
4 consumption of the electric meter corresponds to a number of rotations of the meter
5 wheel.

1 6. The device of claim 1, wherein the predefined communication protocol
2 comprises a data packet comprising:

- 3 a receiver address identifying the receiver of the data packet;
4 a sender address identifying the sender of the data packet; and
5 a command indicator specifying a predefined command code;

1 7. The device of claim 6, wherein the data packet further comprises a data payload
2 and a checksum field for performing a redundancy check.

1 8. The device of claim 7, wherein the data packet further comprises:
2 a packet length indicator which indicates a total number of bytes in the
3 current packet;
4 a total packet indicator which indicates the total number of packets in the
5 current message; and
6 a current packet indicator which identifies the current packet; and
7 a message number identifying the current message.

1 9. A device for measuring electricity consumption, the device adapted for use in
2 an automated monitoring system for providing remote monitoring of electricity
3 consumption, the automated monitoring system comprising a site controller in
4 communication with a plurality of electric meters via a wireless communication
5 network and in communication with a host computer via a wide area network, the
6 communication device comprising:

7 an electric meter configured for measuring the electricity consumption of a load
8 associated with the electric meter;

9 a data interface configured to receive data related to the electricity consumption
10 of the electric meter;

11 memory comprising a unique identifier corresponding to the electric meter;

12 logic configured to receive the data related to the electricity consumption of the
13 electric meter, retrieve the unique identifier corresponding to the electric meter, and
14 generate a transmit message using a predefined communication protocol being
15 implemented by the wireless communication network, the transmit message comprising
16 the unique identifier and the data related to the electricity consumption of the electric
17 meter and configured such that the transmit message may be received by the site
18 controller via the wireless communication network and such that the site controller may
19 identify the electric meter and notify the host computer of the transmit message; and

20 a wireless transceiver configured for communication over the wireless
21 communication network and configured to provide the transmit signal to the wireless
22 communication network and receive messages from the wireless communication
23 network.

1 10. The device of claim 9, wherein the logic is stored in memory and the device
2 further comprises a microcontroller configured to implement the logic.

1 11. The device of claim 9, wherein the wireless transmitter is configured to provide
2 the transmit signal as a radio frequency signal.

1 12. The device of claim 9, wherein the wireless transmitter is configured to provide
2 the transmit signal as a low power radio frequency signal.

1 13. The device of claim 9, wherein the electric meter measures the electricity
2 consumption associated with the electric meter via an electromagnetic meter wheel and
3 the received data related to the electricity consumption of the electric meter
4 corresponds to a number of rotations of the meter wheel.

1 14. The device of claim 9, wherein the predefined communication protocol
2 comprises a data packet comprising:

- 3 a receiver address identifying the receiver of the data packet;
4 a sender address identifying the sender of the data packet; and
5 a command indicator specifying a predefined command code;

1 15. The device of claim 14, wherein the data packet further comprises a data
2 payload and a checksum field for performing a redundancy check.

1 16. The device of claim 15, wherein the data packet further comprises:

- 2 a packet length indicator which indicates a total number of bytes in the
3 current packet;
4 a total packet indicator which indicates the total number of packets in the
5 current message; and
6 a current packet indicator which identifies the current packet; and
7 a message number identifying the current message.

1 17. A communication device adapted for use in an automated monitoring system for
2 providing remote monitoring of electricity consumption, the automated monitoring
3 system comprising a site controller in communication with a plurality of electric meters
4 via a wireless communication network and in communication with a host computer via
5 a wide area network, the communication device comprising:

6 a means for receiving data related to the electricity consumption of an electric
7 meter;

8 a means for storing a unique identifier corresponding to the electric meter;

9 a means for receiving the data related to the electricity consumption of the
10 electric meter, retrieving the unique identifier corresponding to the electric meter, and
11 generating a transmit message using a predefined communication protocol being
12 implemented by the wireless communication network, the transmit message comprising
13 the unique identifier and the data related to the electricity consumption of the electric
14 meter and configured such that the transmit message may be received by the site
15 controller via the wireless communication network and such that the site controller may
16 identify the electric meter and notify the host computer of the transmit message; and

17 a means for transmitting the transmit signal to the wireless communication
18 network.

1 18. The device of claim 17, further comprising a means for receiving command
2 messages from the wireless communication network.

1 19. The device of claim 17, wherein the means for receiving data related to the
2 electricity consumption of the electric meter is adapted for use with an electric meter
3 which measures the electricity consumption via an electromagnetic means.

1 20. The device of claim 17, wherein the predefined communication protocol
2 comprises a data packet comprising:

3 a means for identifying the receiver of the data packet;

4 a means for identifying the sender of the data packet; and

5 a command means for specifying a predefined command code;

1 21. The device of claim 20, wherein the data packet further comprises:
2 a means for indicating a total number of bytes in the current packet;
3 a mean for indicating the total number of packets in the current message; and
4 a means for identifying the current packet; and
5 a means for identifying the current message.

1 22. A device for measuring the electricity consumption corresponding to a load
2 associated with the electric meter, the electric meter adapted for use in an automated
3 monitoring system for providing remote monitoring of electricity consumption, the
4 automated monitoring system comprising a site controller in communication with a
5 plurality of electric meters via a wireless communication network and in
6 communication with a host computer via a wide area network, the communication
7 device comprising:

8 a means for measuring the electricity consumption of a load;

9 a means for receiving data related to the electricity consumption of the electric
10 meter;

11 a means for storing a unique identifier corresponding to the means for
12 measuring the electricity consumption of the load;

13 a means for receiving the data related to the electricity consumption of the
14 electric meter, retrieving the unique identifier corresponding to the electric meter, and
15 generating a transmit message using a predefined communication protocol being
16 implemented by the wireless communication network, the transmit message comprising
17 the unique identifier and the data related to the electricity consumption of the electric
18 meter and configured such that the transmit message may be received by the site
19 controller via the wireless communication network and such that the site controller may
20 identify the electric meter and notify the host computer of the transmit message; and

21 a wireless transceiver configured for communication over the wireless
22 communication network and configured to provide the transmit signal to the wireless
23 communication network and receive messages from the wireless communication
24 network.

1 23. The device of claim 22, wherein the means for measuring the electricity
2 consumption of the load is an electromechanical means.

1 24. The device of claim 22, wherein the predefined communication protocol
2 comprises a data packet comprising:

- 3 a means for identifying the receiver of the data packet;
- 4 a means for identifying the sender of the data packet; and
- 5 a command means for specifying a predefined command code;

1 25. The device of claim 24, wherein the data packet further comprises:

- 2 a means for indicating a total number of bytes in the current packet;
- 3 a means for indicating the total number of packets in the current message; and
- 4 a means for identifying the current packet; and
- 5 a means for identifying the current message.

1 26. A system for providing remote monitoring of electricity consumption, the
2 system comprising:

3 a plurality of electric meters, each of the plurality of electric meters configured
4 to measure the electricity consumption of a load attached to the electric meter;

5 a plurality of communication devices having a unique address and defining a
6 wireless communication network, each of the plurality of communication devices
7 associated with one of the plurality of electric meters and configured to receive data
8 related to the electricity consumption of the electric meter data and generate a transmit
9 message using a predefined communication protocol being implemented by the
10 wireless communication network, the transmit message comprising the unique
11 identifier and the data related to the electricity consumption of the electric meter; and

12 a site controller configured for communication with the wireless communication
13 network and configured to receive the transmit message from one of the plurality of
14 communication devices, identify the electric meter associated with the transmit
15 message, and provide information related to the transmit message to a wide area
16 network for delivery to a host computer.

1 27. The system of claim 26, wherein the site controller is further configured to
2 provide a command message to one of the plurality of communication devices and, in
3 response, the one of the plurality of communication devices provides the transmit
4 message corresponding to the command message.

1 28. The system of claim 26, further comprising the host computer.

1 29. The system of claim 27, wherein the command message is provided to the site
2 controller by the host computer.

1 30. The system of claim 27, wherein the host computer is configured to enable a
2 user associated with one of the plurality of electric meters to initiate the command
3 message via the wide area network.

1 31. The device of claim 26, wherein the predefined communication protocol
2 comprises a data packet comprising:

- 3 a receiver address identifying the receiver of the data packet;
4 a sender address identifying the sender of the data packet; and
5 a command indicator specifying a predefined command code;

1 32. The device of claim 31, wherein the data packet further comprises a data
2 payload and a checksum field for performing a redundancy check.

1 33. The device of claim 32, wherein the data packet further comprises:
2 a packet length indicator which indicates a total number of bytes in the
3 current packet;
4 a total packet indicator which indicates the total number of packets in the
5 current message; and
6 a current packet indicator which identifies the current packet; and
7 a message number identifying the current message.

1 34. A system for providing remote monitoring of electricity consumption, the
2 system comprising:

3 a plurality of means for measuring the electricity consumption of an attached
4 load;

5 a plurality of communication means having a unique address and defining a
6 wireless communication network, each of the plurality of communication means
7 associated with one of the plurality of means for measuring the electricity consumption
8 comprising a means for receiving data related to the electricity consumption of the
9 electric meter data and a means for generating a transmit message using a predefined
10 communication protocol being implemented by the wireless communication network,
11 the transmit message comprising the unique identifier and the data related to the
12 electricity consumption of the electric meter; and

13 a means for receiving the transmit message from one of the plurality of
14 communication devices, identifying the electric meter associated with the transmit
15 message, and providing information related to the transmit message to a wide area
16 network for delivery to a host computer.